

Describe the following transformations of $y=x^2$

① $2(x-3)^2+3$
 vert. stretch 2
 rt 3
 up 3

② $-4x^2+7$
 flip
 vert. stretch 4
 up 7



Describe the following transformations of $y=\sqrt{1-x^2}$

① $2\sqrt{1-x^2}$
 vert. stretch 2

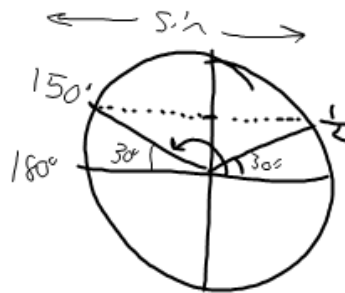
② $\sqrt{1-(\frac{x}{2})^2}$
 horz. stretch 2

Find x in interval $[0, 2\pi)$

① $\sin x = \frac{1}{2}$
 triangle

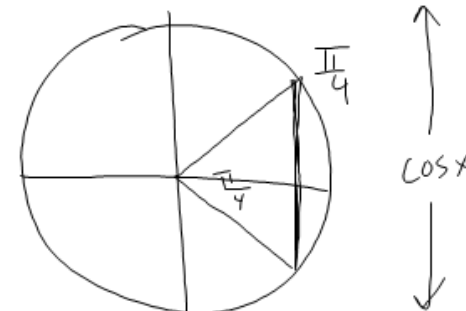
$30^\circ, 150^\circ$

$\rightarrow \frac{\pi}{6}, \frac{5\pi}{6}$



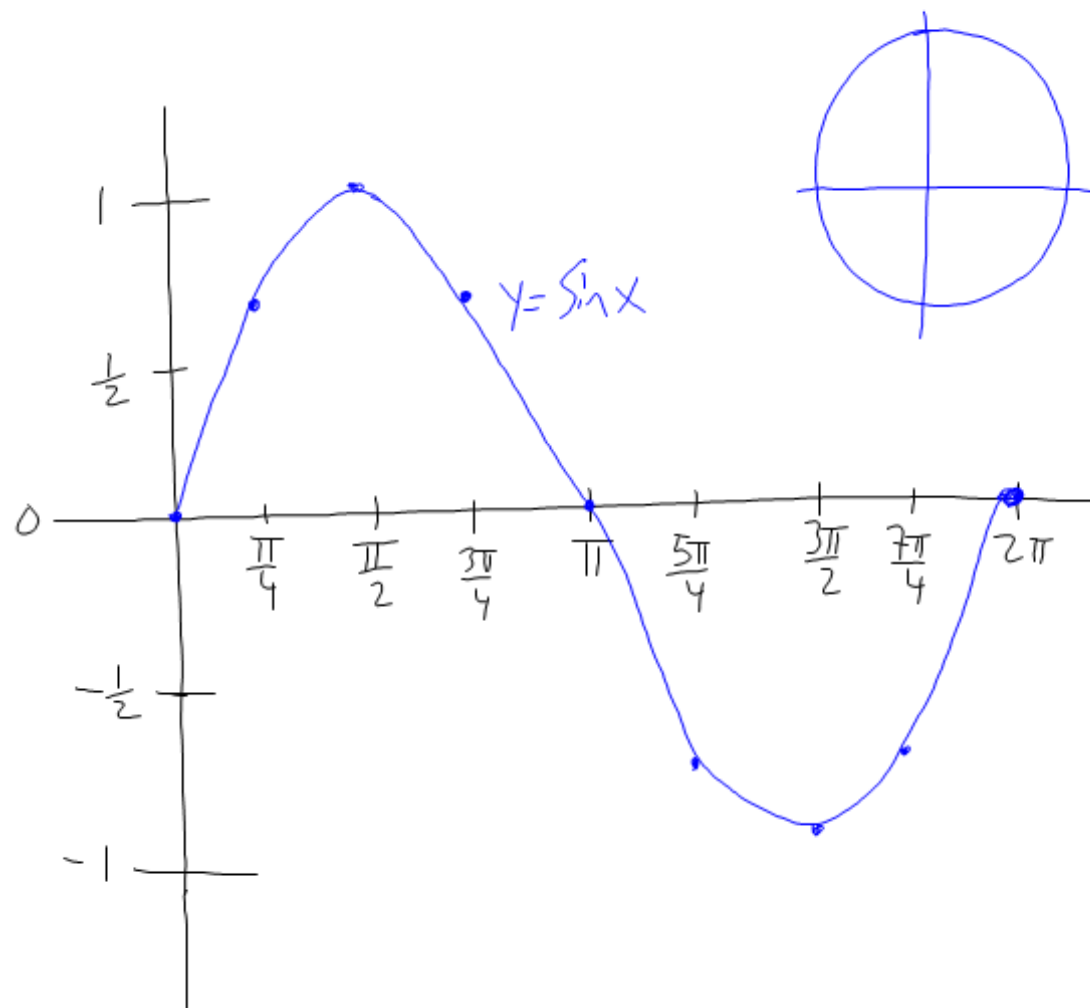
② $\cos x = \frac{\sqrt{2}}{2}$

$x = \frac{\pi}{4}, \frac{7\pi}{4}$



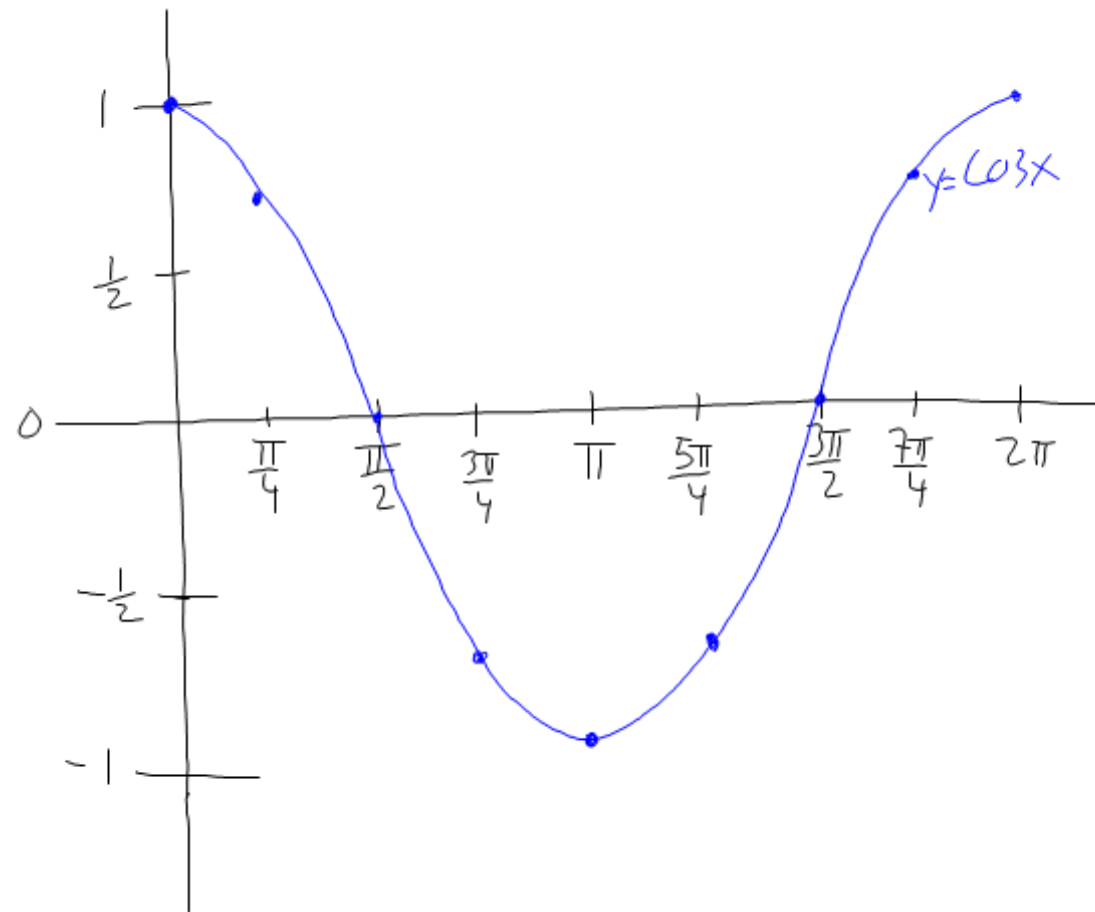
Complete table + graph

x	$\sin x$
0	0
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$
$\frac{\pi}{2}$	1
$\frac{3\pi}{4}$	$\frac{\sqrt{2}}{2}$
π	0
$\frac{5\pi}{4}$	$-\frac{\sqrt{2}}{2}$
$\frac{3\pi}{2}$	-1
$\frac{7\pi}{4}$	$-\frac{\sqrt{2}}{2}$
2π	0



Complete table + graph

x	$\cos x$
0	1
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$
$\frac{\pi}{2}$	0
$\frac{3\pi}{4}$	$-\frac{\sqrt{2}}{2}$
π	-1
$\frac{5\pi}{4}$	$-\frac{\sqrt{2}}{2}$
$\frac{3\pi}{2}$	0
$\frac{7\pi}{4}$	$\frac{\sqrt{2}}{2}$
2π	1

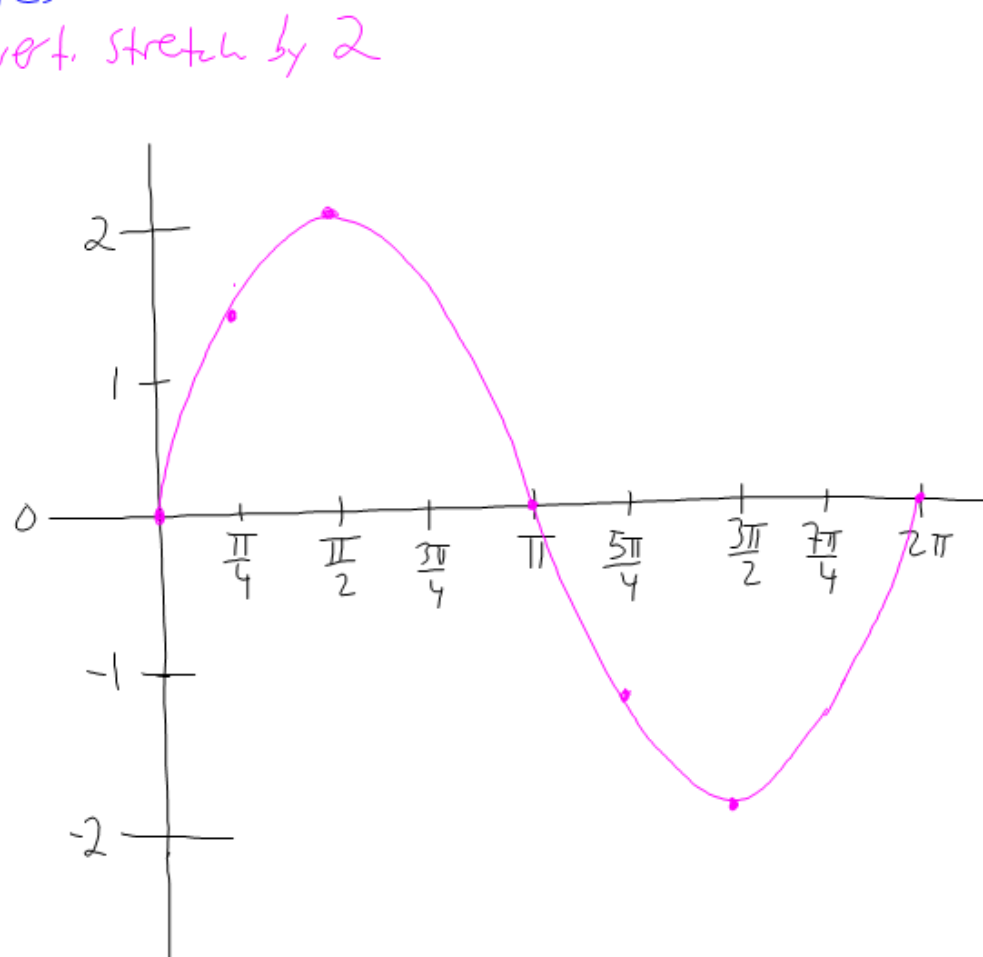


Graph by hand, including coordinates

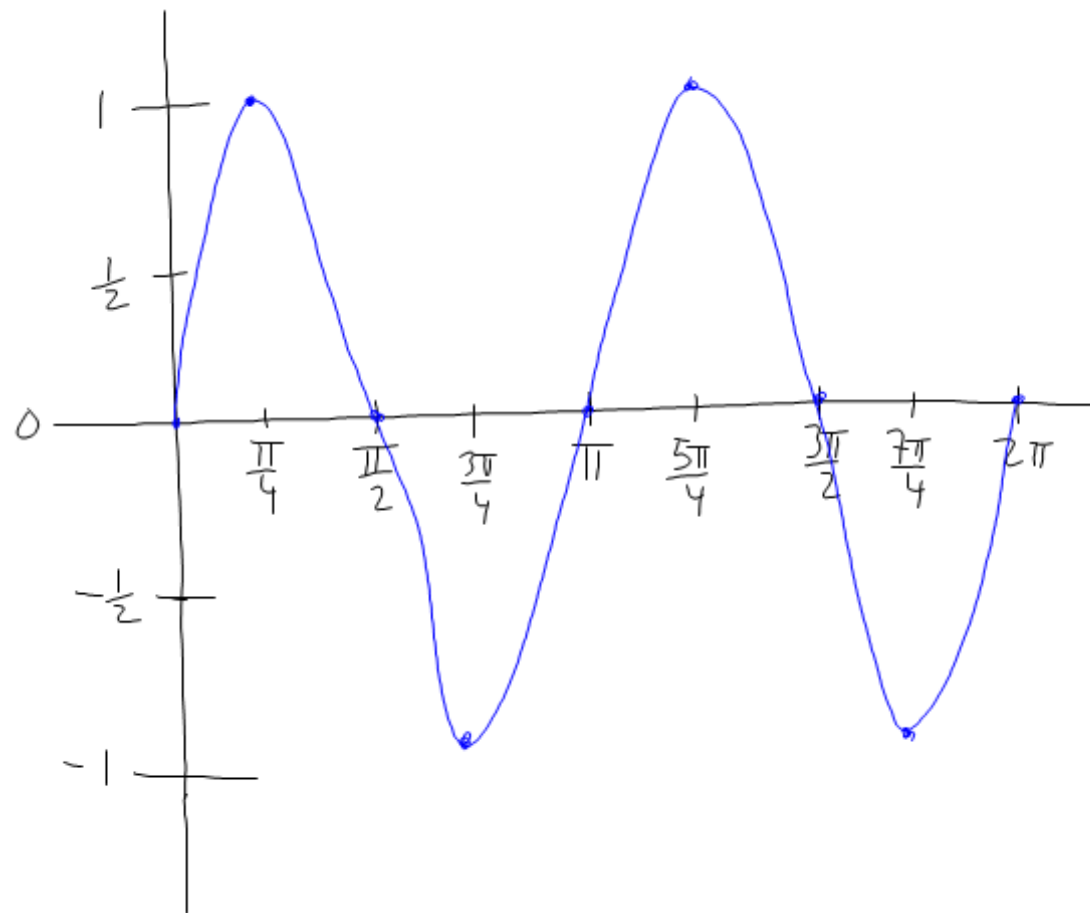
① $y = 2\sin x$

② $y = \sin 2x$

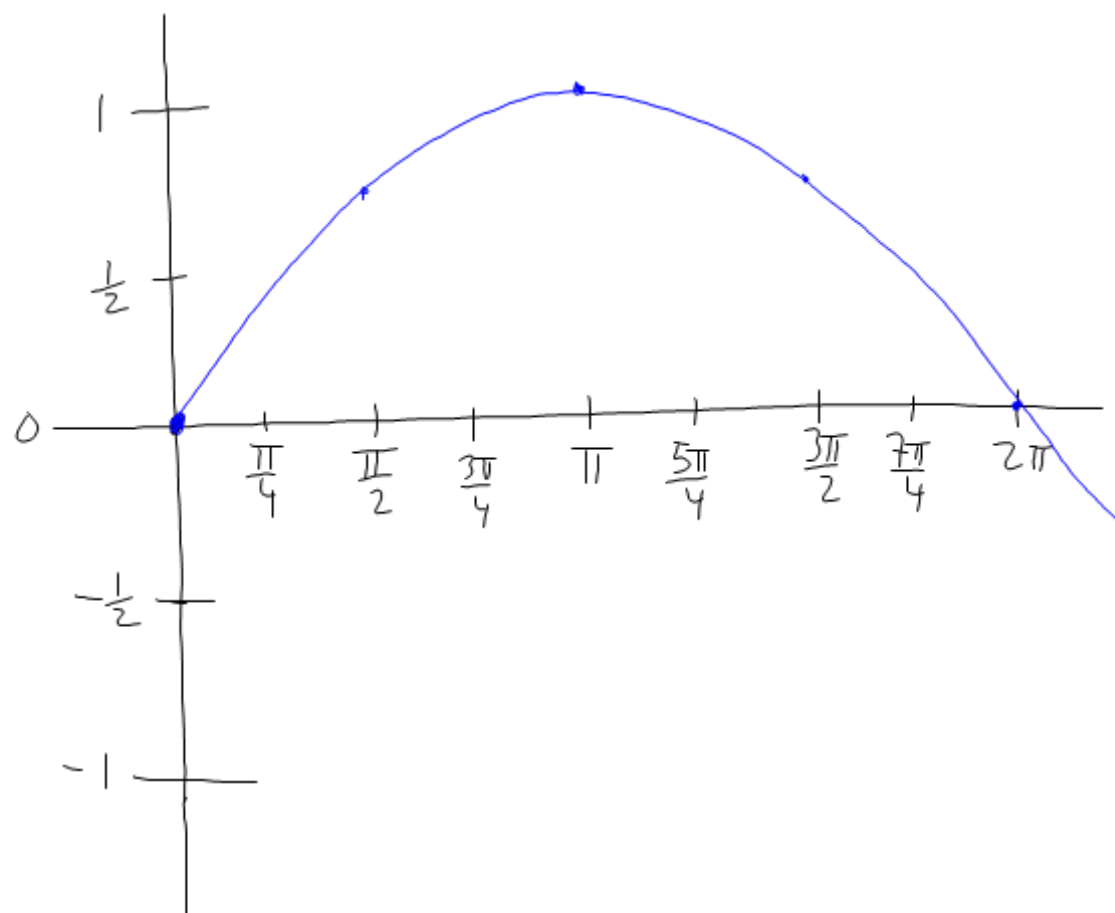
x	$\sin x$	$2\sin x$
0	0	0
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\sqrt{2}$
$\frac{\pi}{2}$	1	2
$\frac{3\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\sqrt{2}$
π	0	0
$\frac{5\pi}{4}$	$-\frac{\sqrt{2}}{2}$	$-\sqrt{2}$
$\frac{3\pi}{2}$	-1	-2
$\frac{7\pi}{4}$	$-\frac{\sqrt{2}}{2}$	$-\sqrt{2}$
2π	0	0



x	$\sin x$	$\sin(2x)$ ← horz. compression
0	0	0
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	1
$\frac{\pi}{2}$	1	0
$\frac{3\pi}{4}$	$\frac{\sqrt{2}}{2}$	-1
π	0	0
$\frac{5\pi}{4}$	$-\frac{\sqrt{2}}{2}$	-1
$\frac{3\pi}{2}$	-1	0
$\frac{7\pi}{4}$	$-\frac{\sqrt{2}}{2}$	-1
2π	0	0

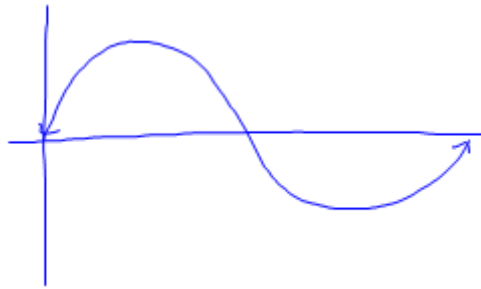


x	$\sin x$	$\sin \frac{1}{2}x$
0	0	0
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	
$\frac{\pi}{2}$	1	$\frac{\sqrt{2}}{2}$
$\frac{3\pi}{4}$	$\frac{\sqrt{2}}{2}$	
π	0	1
$\frac{5\pi}{4}$	$-\frac{\sqrt{2}}{2}$	
$\frac{3\pi}{2}$	-1	$\frac{\sqrt{2}}{2}$
$\frac{7\pi}{4}$	$-\frac{\sqrt{2}}{2}$	
2π	0	0

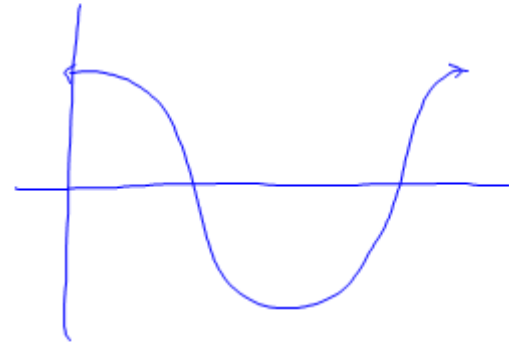


Trigonometric Graphs

• $y = \sin x$



$y = \cos x$



• $a \sin bx$, $a \cos bx$

a = Vertical Stretch or compression
 $2 \sin x$ $\frac{1}{2} \sin x$

b = horizontal stretch or compression, frequency
 $\sin(\frac{1}{2}x)$ $\sin(2x)$

$$P = \frac{2\pi}{b}$$

$$b = \frac{2\pi}{P}$$

Sect. 4.1 Read Sect.

1-4, 17-22